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(21) International Application Number: PCT/US96/14766 (22) International Filing Date: 16 September 1996 (16.09.96) (30) Priority Data: 95118617.0 27 November 1995 (27.11.95) EP <i>(34) Countries for which the regional or international application was filed:</i> BE et al. (71) Applicant (for all designated States except US): THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): TCHEOU, Eric [FR/BE]; Boulevard Louis-Schmidt 43, B-1040 Brussels (BE). VEGA, Jose, Luis [ES/BE]; Bloemendallaan 47, B-1853 Strombeek-Bever (BE). (74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: COMPOSITION FOR TREATING STAINS ON LAUNDRY ITEMS AND METHOD OF TREATMENT (57) Abstract <p>The present invention relates to a cleaning composition which is an oil-in-water or water-in-oil emulsion or a solution comprising non-aqueous hydrophobic solvent; first anionic or nonionic surfactant having an alkyl chain, the length of the alkyl chain being C₁₁ or less; and second anionic or nonionic surfactant having an alkyl chain, the length of the alkyl chain being C₁₂ or more. The cleaning composition has a pH greater than 8. The invention also relates to a method for treating a spot or stain on a textile fabric using the cleaning composition.</p>		

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COMPOSITION FOR TREATING STAINS ON LAUNDRY ITEMS AND METHOD
OF TREATMENT

The present invention relates to compositions for treating stains on laundry items. Laundry items can be treated either before or after a conventional laundering process by application of the composition in the region of the stain so that the stain is at least partially released and removal of the stain is made easier.

Emulsions of solvent-aqueous systems are known to be effective as spot pretreating compositions on both hydrophobic and hydrophilic stains.

GB-A-2 194 547, published on 9th March 1988, discloses mixtures of n-dodecane with both short-chain (Neodol 91-6) and long chain (Neodol 45-1) nonionics. The compositions are in the form of liquid solutions; water-in-oil or oil-in-water microemulsions, or gels. However this application does not disclose compositions which comprise alkali material.

US-A-4 093 418, issued on 6th June 1978, and US-A-4 178 262, issued on 11th December 1979, disclose isoparaffin (C₁₁-C₁₄) in combination with long-chain (C₁₀-C₁₈) nonionics.

The present invention relates to a cleaning composition which is an oil-in-water or water-in-oil emulsion or a solution comprising non-aqueous hydrophobic solvent; first anionic or nonionic surfactant having an alkyl chain, the length of the alkyl chain being C₁₁ or less; and second anionic or nonionic surfactant having an alkyl chain, the length of the alkyl chain being C₁₂ or more.

It is the objective of the present invention to improve the cleaning performance of stain treatment compositions particularly on fatty or greasy stains, including cosmetics and food stains such as cream, milk, sauces.

Another object of the present invention is to improve the removal of bleachable stains through the application of the composition of the present invention and the application of a bleaching compound, preferably a peroxide compound.

Summary of the Invention

The objective of the present invention is achieved by providing a cleaning composition which has a pH greater than 8, thereby enhancing cleaning performance for both fatty stains and bleachable stains. Preferably the pH is greater than 9, and more preferably greater than 10.

The cleaning composition preferably comprises water from 5% to 95% by weight of the composition.

The invention also relates to a method for treating a spot or stain on a textile fabric using the cleaning compositions of the invention.

Detailed description of the invention

Hydrophobic solvents are an essential feature of the compositions of the present invention. Preferred hydrophobic solvents are defined in terms of Hansen parameters. A hydrophobic solvent as defined herein is considered to be a solvent having Hansen hydrogen bonding cohesion parameter dH below $18 \text{ (Joule/cm}^3)^{0.5}$. Preferred hydrophobic solvents have a Hansen hydrogen bonding cohesion parameter dH below $12 \text{ (Joule/cm}^3)^{0.5}$ and a Hansen polar parameter dP below $8 \text{ (Joule/cm}^3)^{0.5}$.

Preferred solvents for use comprise mixtures of hydrocarbons with a flash point no lower than 70°C, an

initial boiling point no lower than 130°C, preferably no lower than 145°C, and a solidification point not above 20°C and aliphatic fatty acid esters. More preferred solvents would be alkanes or alkenes with a chain length above C7, and particularly alkanes and alkenes with an average of C8 to C20 atoms. Particularly preferred hydrophobic solvents are deodorised kerosine; solvent naphta; chlorinated hydrocarbons; and terpenes. Even more preferred are paraffins; isoparaffins; naphthenes; aromatics; olefins; 1,1,1-trichloroethane perchloroethylene; methylene chloride; Shellsol SS[®] mixture (C8-C11 isoparaffin + 5% aliphatic C7 ester); D-Limonene; and Glidsafe[®] supplied by Glidsol. Solvents are used in the detergent compositions of the present invention preferably at a level of from 3% to 90%, more preferably from 4% to 45%, and most preferably from 5% to 25% by weight of the detergent composition.

Other solvents having a Hansen parameter of dH less than 18 (Joule/cm³)^{0.5} include glycol ethers, more preferably glycol ethers based upon ethylene oxide, propylene oxide, or mixtures thereof. Particularly preferred are ethylene glycol monoethyl ether; Propylene glycol monomethyl ether; 2-butoxy ethanol; butyl diethylene glycol ether ethanol; butoxytriglycol; butylene glycol; hexylene glycol; and propyl propanol. Such solvents are used in combination with

mixtures of short chain surfactants and long chain surfactants.

By "short-chain" what is meant herein is surfactants which comprise a C_6-C_{11} alkyl chain as their hydrophobic portion. Such short-chain surfactants are accordingly those conventionally used in this field, but with a shorter alkyl chain, and can be of any type. Accordingly, suitable short chain surfactants for use herein include C_6-C_{11} alkyl sulfates ($C_6-C_{11}SO_4$), alkyl ether sulfates ($C_6-C_{11}(OCH_2CH_2)_eSO_4$), alkyl sulfonates ($C_6-C_{11}SO_3$), alkyl succinates ($C_6-C_{11}OOCCH_2CH_2COOZ$), alkyl carboxylates ($C_6-C_{11}COOM$), alkyl ether carboxylates ($C_6-C_{11}(OCH_2CH_2)_eCOOM$), alkyl sarcosinates ($C_6-C_{11}CON(CH_3)R$), alkyl sulfo succinates ($C_6-C_{11}OOCCH(SO_3M)CH_2COOZ$), amine oxides ($C_6-C_{11}RR'NO$), glucose amides ($C_6-C_{11}CONR''X$), alkylpyrrolidones ($C_6-C_{11}(C_4H_6ON)$), alkylpolysaccharides ($C_6-C_{11}OG_g$), alkyl alkoxyates ($C_6-C_{11}(OCH_2CH_2)_e(OCH_2CH_2CH_2)_pOH$) and betaines ($C_6-C_{11}N^+(CH_3)_2CH_2COO^-$). In the formulae in brackets, e and p are independently from 0 to 20 and $e+p>0$, Z is M or R , M is H or any counterion such as those known in the art, including Na , K , Li , NH_4 , amine, X is a polyhydroxyhydrocarbyl having a linear hydrocarbyl chain with at least 3 hydroxyls directly connected to the chain, or an alkoxyated derivative thereof, R , R' and R'' are C_1-C_5 alkyl groups, possibly functionalized with hydroxyl

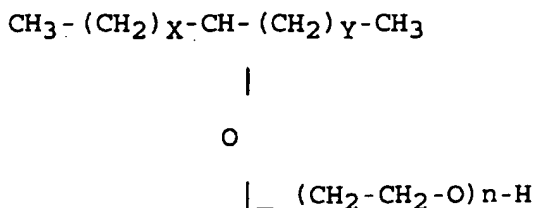
groups, R and R' are preferably C₁-C₃, most preferably methyl, R'' is preferably 2-hydroxyethyl or 2 hydroxypropyl, G is saccharide, preferably glucose, and g is of from 1.5 to 8. All these surfactants are well known in the art. A more complete disclosure of conventional glucose amides can be found for instance in WO 92-06154 and a more complete disclosure of conventional alkyl polysaccharides can be found for instance in US 4,536,319. The compositions according to the present invention may comprise any of the above surfactants alone, or any combination thereof.

Preferred short chain nonionic surfactants for use herein are alkyl alkoxyates according to the formula C₆-C₁₁(OCH₂CH₂)_e(OCH₂CH₂CH₂)_pOH, where e and p representing respectively the degree of ethoxylation and propoxylation, are independently of from 0 to 20, and that e+p>0. Most preferred short chain nonionic surfactants for use herein are those where e and p are such that e+p is from 3 to 10, particularly those where p is 0 and e is 3 to 8. Also, most preferred short chain nonionic surfactants for use herein are those where said short chain is a hydrocarbon chain comprising from 7 to 11 carbon atoms. Said preferred short chain nonionic surfactants for use herein can be manufactured by the processes well known to the man skilled in the art, such as condensation of the corresponding alcohol and alkylene oxide, but such short chain

surfactants are more conveniently commercially available for instance from Sidobre under the trade name Mergital® C₄ (C₈EO₄), from Kolb under the trade names Imbentin® AG/810/050 and AG/810/080 (respectively C₈-10EO₅ and C₈-10EO₈); from Shell under the trade name Dobanol 91-2.5 (C₉-C₁₁ EO_{2.5}), Dobanol 91-6 (C₉-C₁₁ EO₆), Dobanol 91-4-6; from Vista Chemicals Vista 1012-52, from EXXON Asopol 91-4.6.

Another preferred class of short chain nonionic surfactants are secondary alcohol ethoxylates according to the formula

:



wherein (X+Y) is from 2 to 10 and the number of ethoxylate groups n is from 1 to 7. Example of commercially available surfactants of this type include the Tergitol S series from Union Carbide.

Preferred short chain anionic surfactants for use herein are C₆-C₁₁ alkyl sulfates and C₆-C₁₁ alkyl sulfonates, C₆-C₁₁ betaines, C₆-C₁₁ amine oxides and mixtures thereof. Most preferred are the C₆-C₈ alkyl sulfates and sulfonates. Such short chain anionic surfactants can be made by well

known sulphation or sulphonation processes followed by neutralization, but said anionic short chain surfactants are more conveniently commercially available, for instance from Rhone Poulenc under the trade name Rhodapon ® OLS, or from Witco under the trade name Witconate®.

Any alkaline materials is suitable for use in the present invention. Preferred alkaline materials are selected from the group consisting of potassium hydroxide, sodium hydroxide, ammonium hydroxide, ammonium silicate, sodium bicarbonate, borax, monoethanolamine borate, monoethanolamine triethanolamine, and mixtures thereof. In general the spot treating composition comprises from 0.1% to 10%, preferably 0.5% to 3% by weight of the alkaline material. The pH is greater than 8, more preferably greater than 9, and most preferably greater than 10. pH of the neat compositions was measured by means of a portable pH meter from Knick (Portamess 752).

By "long-chain" what is meant herein is surfactants having an alkyl chain, the alkyl chain comprising 12, or more than 12 carbon atoms.

Non-limiting examples of long-chain surfactants useful herein include the conventional C₁₂-C₁₈ alkyl benzene sulfonates ("LAS") and primary, branched-chain and random C₁₂-C₂₀ alkyl sulfates ("AS"), the C₁₂-C₁₈ secondary (2,3) alkyl sulfates of the formula CH₃(CH₂)_x(CHOSO₃^{-M+}) CH₃ and

$\text{CH}_3 (\text{CH}_2)_y (\text{CHOSO}_3^- \text{M}^+) \text{CH}_2 \text{CH}_3$ where x and $(y+1)$ are integers of at least about 7, preferably at least about 9, and M is a water-solubilizing cation, especially sodium, unsaturated sulfates such as oleyl sulfate, the C_{12} - C_{18} alkyl alkoxy sulfates (" AE_xS "; especially EO 1-7 ethoxy sulfates), C_{12} - C_{18} alkyl alkoxy carboxylates (especially the EO 1-5 ethoxycarboxylates), the C_{12} - C_{18} glycerol ethers, the C_{12} - C_{18} alkyl polyglycosides and their corresponding sulfated polyglycosides the C_{12} - C_{18} alpha-sulfonated fatty acid esters methyl ester sulphonate (MES), and oleyl sarcosinates. The conventional nonionic and amphoteric surfactants such as the C_{12} - C_{18} alkyl ethoxylates (" AE ") particularly preferred are C_{12} - C_{16} fatty alcohol polyglycol ethers or ethoxylated primary alcohols with EO 2-7 (especially ethoxylates and mixed ethoxy/propoxy), C_{12} - C_{18} betaines and sulfobetaines (" sultaines "), C_{12} - C_{18} amine oxides, and the like, can also be included in the overall compositions. The C_{12} - C_{18} N-alkyl polyhydroxy fatty acid amides can also be used. Typical examples include the C_{12} - C_{18} N-methylglucamides. See WO 9,206,154. Other sugar-derived surfactants include the N-alkoxy polyhydroxy fatty acid amides, such as C_{12} - C_{18} N-(3-methoxypropyl) glucamide. The N-propyl through N-hexyl C_{12} - C_{18} glucamides can be used for low sudsing. C_{12} - C_{20} conventional soaps may also be used. If high sudsing is desired, the branched-chain C_{12} - C_{16} soaps may be used. Mixtures of anionic and nonionic

surfactants are especially useful. Other conventional useful surfactants are listed in standard texts.

A particularly preferred composition according to the present invention comprises from 5% to 50% by weight of a mixed nonionic system comprising first, short-chain nonionic surfactant and second, long-chain nonionic surfactant. More preferably the composition comprises from 10% to 40% by weight of the mixed nonionic surfactant, and most preferably from 15% to 30%. The nonionic system preferably has an overall HLB value of from 2 to 16, more preferably from 8 to 14, most preferably from 9 to 10. Furthermore it is preferred that the ratio of first surfactant to second surfactant is from 1:10 to 10:1, more preferably from 1:3 to 3:1, and most preferably about 1:1.

Bleaching agents may also be useful in the method of the present invention for treating bleachable stains. The bleaching agents may be incorporated into the compositions described above, or may be added as separate bleaching compositions. Peroxide bleaching agents are most preferred.

The detergent composition of the present invention is useful in various known and conventional cleaning methods. However a preferred cleaning method comprises the steps of applying the detergent composition to the spot or stain;

placing an absorbent layer adjacent to the textile fabric in the region of the spot or stain; and applying heat, pressure, or heat and pressure to the textile fabric in the region of the spot or stain; so that some or all of the spot or stain is absorbed into the absorbent layer.

A still more preferred cleaning method comprises the steps of :

(a) applying the detergent composition to a spot or stain and placing an absorbent layer adjacent to the textile fabric in the region of the spot or stain and a first means for transferring some or all of the spot or stain into the absorbent layer; optionally also applying a peroxide bleaching agent and subsequently

(b) applying a hydrophilic solvent or water, to the textile fabric in the region of the spot or stain and placing an absorbent layer adjacent to the textile fabric in the region of the spot or stain and the step of applying heat to the textile fabric in the region of the spot or stain.

The application of heat or pressure, or both, may be achieved by any means, but is most preferably achieved by a hand-held device such as an iron. A conventional iron having a hot-plate fixed to a body is a highly preferred hand held device. The hot-plate is heated most commonly by electrical means, and may have a means for controlling the temperature. A supply of water or steam may also be provided by the iron. Most preferably the absorbent layer is placed on a flat surface, such as an ironing board, and

the stained or soiled textile fabric is laid flat on top of, and in contact with, the absorbent layer. The iron can then be easily applied to the textile fabric in the region of the stain or spot in order to ensure complete, or substantially complete, transfer of the stain or spot into the absorbent layer. The iron is preferably operated at a temperature of from 40°C to 200°C, more preferably from 40°C to 180°C.

An alternative device for applying heat or pressure is a heated roller or any other heated applicator. The roller or applicator may also be provided with a supply of the detergent composition.

Suitable applicators include a steam iron with suction brush attachment, such as that disclosed in EP-A-0 493 348, and a thermoelectric applicator, such as that disclosed in EP-A-0 552 397. Also suitable is a steam iron with atomiser, such as that disclosed in EP-A-0 629 736 wherein the detergent composition may optionally be stored in the iron and delivered directly onto the textile fabrics by means of the atomiser.

Without wishing to be bound by theory it is believed that hydrophobic stains are first rendered hydrophilic by applying a detergent composition, optionally with a gentle rubbing action. Greasy stains which contain hydroxyl

groups are deprotonated at high pH and are thus rendered more easy to solubilize in the detergent solution. Higher pH can also induce soil peptization on some food stains. The stains are in effect broken down, and rendered easier to remove. The benefits of high pH can be particularly observed when before or after application of the detergent composition, another composition containing a bleaching species is applied on the stain. Indeed, conventional peroxide bleaching technologies have an increased reactivity with pH. Water is then applied to the stain, again, optionally with a gentle rubbing action. The stain is removed by laying the stained fabric adjacent to an absorbent layer. The stain, which has been rendered more hydrophilic by the treatment, is transferred to the absorbent layer.

Textile fabrics are any materials made from cloth, including garments such as shirts, blouses, socks, skirts, trousers, jackets, underwear etc, and also including tablecloths, towels, curtains etc. The definition of textile fabrics as used herein does not include carpets and similar floor coverings.

Textile fabrics which are to be used in the present invention are commonly made by weaving or knitting. Many different fibres may be used to produce woven, knitted or

other types of textile fabric including synthetic fibres (such as polyester, polyamide, etc.) and natural fibres from plants (such as cotton, hemp) and from animals (such as wool, angora, silk). Blends of different fibres are also commonly used.

EXAMPLES

	Example 1	Example 2	Example 3	Example 4
Shellsol [®]	20	20	20	20
Dobanol 25EO3 [®]	5	5	5	-
Alkyl sulphate	5	-	5	5
C8AS				
Dehydol C8EO4 [®]	-	5	-	5
Sodium hydroxide	1	1	-	-
Monoethanolamine	-	-	3	3
Water	69	69	67	67

In the examples, Shellsol [®] is a mixture of C₈-C₁₁ isoparaffins with 5% aliphatic C₇ ester.

Dehydol [®] is a fatty alcohol polyglycol ether octyl with an average of 4EO, supplied by Henkel.

Dobanol [®] is a ethoxylated primary alcohol with an average of 3EO, supplied by Shell.

Alkyl sulphate, C8AS, has an average of 8 carbon atoms in the alkyl chain.

These emulsions were prepared by mixing the components in the following order : Dobanol 25E3 was first mixed with the Shellsol solvent. The short-chain surfactant (alkyl sulphate or Dehydol) was then added followed by an aqueous

solution of sodium hydroxide. Mixing was continued until a stable oil-in-water emulsion was formed.

Example 5 Example 6 Example 7

Limonene	18.3	18.3	23.5
HLAS	10.5	-	-
Dehydol C8EO4 [®]	6	16.5	-
Alkyl Sulphate C8A5	-	-	7.8
Monoethanolamine	3	3	5.8
Butyl carbitol	10	10	11.7
Oleic acid	-	-	6
Water	balance	balance	balance

Example 8 Example 9 Example 10 Example 11

Dodecane	22	48.2	-	-
Hexadecane	-	-	10	-
Tridecane	-	-	-	20
C14-15EO1	5.5	14.8	10	-
C12-15EO3	-	-	-	5
C9-11EO6	22	34.2	7.5	-
C8EO4	-	-	-	5
Sodium hydroxide	1	1	1	1
Butyl carbitol	-	0.8	-	-
Water	balance	balance	balance	balance

In example 11, the tridecane was replaced by :

Isopar K® which is a C₁₀-C₁₂ isoparaffinic hydrocarbon
from Exxon

Glidsol 66-2 which is a mixture of terpene hydrocarbon from
Glidoc

Glidsol 100 which is a mixture of terpene hydrocarbon from
Glidoc

Invert 2000 which is a citrus terpene/water emulsion from
Dow

Example 12 Example 13

Shellsol	20	20
Dobanol 25-3 (C ₁₂ EO ₃)	0.2	5.2
C8 Alkyl sulphate	5	5
C10 Alkyl sulphate	0.2	0.2
Dehydol 04 (C ₈ EO ₄)	5	-
Sodium hydroxide	0.3	0.3
DTPMP	0.04	0.04
Dobanol 90	0.3	0.3
Hydrogen peroxide	1.4	1.4
Water	balance	balance
	pH = 9	pH = 9

DTPMP is diethylene triamine penta methylene phosphonic acid from Monsanto, Dequest 2060.

A set of polycotton swatches (50mm square) were soiled with make-up, chocolate sauce and tomato sauce. The stain was left to age for a day, in the dark, at normal room temperature (c.a. 20°C, 60%RH). Each soiled swatch was cleaned by the following method:

1. The stained area was placed directly upon a strip of absorbent paper (the paper used was the absorbent core of a diaper).
2. 1 ml of the composition of Example 1 was dripped on to the stained area.
3. The stained area was brushed with a conventional electrical toothbrush for 10 seconds (the toothbrush used, a Braun[®] dental d3, was one normally intended for daily oral care).
4. The steps 2. and 3. were repeated one more time.
5. 1 ml of distilled water was dripped on to the stained area, and pressure and heat were applied using an iron set at a temperature of 120°C for 10 seconds. A typical ironing

pressure, as normally used for removing wrinkles in fabrics, was used.

6. Step 5. was repeated with a further 2ml of distilled water.

7. The swatch was dried and smoothed.

The method of cleaning was repeated on stained swatches using the compositions of Examples 2 to 13 in place of the composition of Example 1.

CLAIMS

1. A cleaning composition which is an oil-in water or water-in-oil emulsion, or a solution, comprising
 - (i) non-aqueous hydrophobic solvent;
 - (ii) first anionic or nonionic surfactant having an alkyl chain, the length of the alkyl chain being C11 or less;
 - (iii) second anionic or nonionic surfactant having an alkyl chain, the length of the alkyl chain being C12 or more; andcharacterised in that the cleaning composition has a pH of at least 8.
2. A cleaning composition according to claim 1 comprising from 0.1 to 10% by weight of an alkaline material, wherein the alkaline material is selected from the group consisting of potassium hydroxide, sodium hydroxide, ammonium hydroxide, ammonium silicate, sodium bicarbonate, borax, monoethanolamine borate, monoethanolamine, triethanolamine, and mixtures thereof.
3. A cleaning composition according to claim 1 further comprising from 5 to 95% by weight of water.
4. A cleaning composition according to claim 1 wherein the pH at 1% solution in distilled water of at least 9, and preferably at least 10.

5. A cleaning composition according to claim 1 comprising from 3% to 90% by weight of the non-aqueous hydrophobic solvent having a Hansen hydrogen bonding cohesion parameter dH below 18 (Joule/cm³)^{0.5} and a Hansen polar parameter dP below 8 (Joule/cm³)^{0.5} .

6. A cleaning composition according to claim 5 wherein the solvent comprises hydrocarbons with a flash point of not less than 70°C, an initial boiling point of greater than 145°C, and a solidification point of less than 20°C.

7. A cleaning composition according to claim 6 wherein the solvent is selected from the group consisting of C₁₀-C₁₈ linear or branched alkanes, terpene or mixtures thereof.

8. A cleaning composition according to claim 1 wherein the second surfactant is selected from the group consisting of C₁₂-C₁₆ fatty alcohol polyglycol ethers or ethoxylated primary alcohols with 2 to 7 ethoxylation.

9. A cleaning composition according to claim 8 comprising from 5% to 50% by weight of a mixed nonionic surfactant system comprising the first and second surfactants, the mixed nonionic surfactant system having an overall HLB value of from 2 to 16.

10. A cleaning composition according to claim 9 wherein the molar ratio of first surfactant to second surfactant is from 1:10 to 10:1.

11. A method of treating a spot or stain on a textile fabric comprising the steps of :
applying the detergent composition of any of the previous claims to the spot or stain;
placing an absorbent layer adjacent to the textile fabric in the region of the spot or stain; and applying heat, pressure, or heat and pressure, to the textile fabric in the region of the spot or stain, so that some or all of the spot or stain is absorbed into the absorbent layer.

12. A method according to claim 11 comprising the steps of :

(a) applying the detergent composition to the spot or stain and placing an absorbent layer adjacent to the textile fabric in the region of the spot or stain and a first means for transferring some or all of the spot or stain into the absorbent layer; and subsequently

(b) applying a hydrophilic solvent, or water, to the textile fabric in the region of the spot or stain and placing an absorbent layer adjacent to the textile fabric in the region of the spot or stain and a second means for transferring some or all of the spot or stain into the absorbent layer.

13. A method according to claim 12, wherein the second means for transferring some or all of the spot or stain, comprises the step of applying heat to the textile fabric in the region of the spot or stain using a hand-held iron.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US96/14766

A. CLASSIFICATION OF SUBJECT MATTER IPC(6) :D06B 1/00; C11D 1/37, 1/83, 3/18 US CL :Please See Extra Sheet. According to International Patent Classification (IPC) or to both national classification and IPC																				
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 510/277, 283, 284, 407, 414, 417, 413, 435, 337, 340, 342, 312, 313, 314, 376; 8/137, 137.5 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched None Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) APS, CAS Online search terms: prespotting, stain remover, nonionic, anionic																				
C. DOCUMENTS CONSIDERED TO BE RELEVANT																				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																		
Y	GB 1,518,676 A (MOULD et al.) 19 July 1978; p. 1, line 40, through p. 2, line 64; and p. 6, lines 9-13.	1-13																		
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A	US 4,634,551 A (BURNS et al.) 06 January 1987.																			
A	US 4,412,934 A (CHUNG et al.) 01 November 1983																			
Y	US 4,199,482 A (RENAUD et al.) 22 April 1980, col. 2, lines 18-68	1-13																		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.																				
<table border="0"> <tr> <td>* Special categories of cited documents:</td> <td>*T</td> <td>later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>*A* document defining the general state of the art which is not considered to be of particular relevance</td> <td>*X*</td> <td>document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>*E* earlier document published on or after the international filing date</td> <td>*Y*</td> <td>document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>*G*</td> <td>document member of the same patent family</td> </tr> <tr> <td>*O* document referring to an oral disclosure, use, exhibition or other means</td> <td></td> <td></td> </tr> <tr> <td>*P* document published prior to the international filing date but later than the priority date claimed</td> <td></td> <td></td> </tr> </table>			* Special categories of cited documents:	*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	*A* document defining the general state of the art which is not considered to be of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	*E* earlier document published on or after the international filing date	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G*	document member of the same patent family	*O* document referring to an oral disclosure, use, exhibition or other means			*P* document published prior to the international filing date but later than the priority date claimed		
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Date of the actual completion of the international search 21 JANUARY 1997		Date of mailing of the international search report 27 MAR 1997																		
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer Douglas J. McGinty Telephone No. (703) 308-3805																		

INTERNATIONAL SEARCH REPORTInternational application No.
PCI/US96/14766

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,205,960 A (KRISTOPEIT et al.) 27 April 1993	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US96/14766

A. CLASSIFICATION OF SUBJECT MATTER:

US CL :

510/277, 283, 284, 407, 414, 417, 413, 435, 337, 340, 342, 312, 313, 314, 376; 8/137, 137.5